

REMARKS

Claims 41-45 and 47-89 are pending in the present application. Claims 41, 42, 44, 48, 50, 62, 67-69, 71-74, 76, 78, 79, 81, 82, 85, and 88 have been amended. Support for the amendments can be found in the as-filed specification at least at paragraphs [0007], [0058]-[0061], [0065], [0069], and [0070]. (All citations to the instant specification are to the US publication, US 2006/0115597). Accordingly, no new matter is being added to the application. Reexamination of the application and reconsideration of the rejections and objections are respectfully requested in view of the above amendments and the following remarks, which follow the order set forth in the Office Action.

Rejections under 35 U.S.C. § 103

Cramer and Csordas

Claims 41-45 and 49-53 were rejected under 35 U.S.C. 103(a) for allegedly being unpatentable over Cramer et al. U.S. Patent No. 3,003,952 ("Cramer") in view of U.S. Patent No. 2,982,614 to Csordas ("Csordas"). Applicants respectfully traverse.

Amended claim 41 recites a method of preparation of a monolithic hydrated alumina, said method comprising, in succession, the following steps: a) abrading of a surface of a part made of aluminium or an aluminium alloy; b) covering said aluminium or aluminium alloy surface with a mercury amalgam comprising at least one noble metal, wherein the at least one noble metal is chosen from the group consisting of silver, gold, palladium, platinum, rhodium, iridium, ruthenium and mixtures thereof; and c) exposing said covered surface obtained at b) to a wet oxidizing atmosphere thereby growing said monolithic hydrated alumina on said aluminium or aluminium alloy surface.

Amended claim 67 recites a method of preparation of a composite material comprising a monolithic hydrated alumina and/or an aluminate and at least one other compound and/or element, said alumina and/or aluminate being obtained by a method comprising, in succession, the following steps: a) abrading a surface of a part made of aluminium or an aluminium alloy; b) covering said aluminium or aluminium alloy surface with a mercury amalgam comprising at least one noble metal, wherein the at least one noble metal is chosen from the group consisting of silver, gold, palladium, platinum, rhodium, iridium, ruthenium and mixtures thereof; and c) exposing said covered surface obtained at b)

to a wet oxidizing atmosphere thereby growing said monolithic hydrated alumina on said aluminium or aluminium alloy surface.

Applicants submit that claims 41 and 67 are not obvious in view of the combination of Cramer and Csordas. As will be explained in greater detail below, Cramer and Csordas provide divergent teachings and thus are not properly combinable. Further, even if Cramer and Csordas are combined, the combination fails to teach or reasonably suggest all of the limitations of claims 41 and 67.

More particularly, claims 41 and 67 recite that the mercury amalgam comprises at least one noble metal. The specification states “the mercury amalgam used within the context of the invention is a mercury amalgam that contains at least one noble metal.” ¶ [0028]. Thus, claims 41 and 67 require that the noble metal be a constituent of the mercury amalgam. In contrast, Cramer discloses a process for manufacturing platinum-alumina catalyst by contacting aluminum metal powder with an excess of water, in the presence of metallic mercury or a mercury compound to convert at least a major portion of the aluminum metal powder into alumina powder slurried in the excess water. *See*, c. 2, ll. 2-11. The alumina slurry is then contacted with a solution of a platinum compound to obtain a composite that is then dried and calcined. *See*, c. 2, ll. 11-15. In each of the disclosed embodiments in Cramer, the aluminum is “substantially completely converted into alumina [by contact with metallic mercury or a mercury compound] and thereafter impregnated with ... a platinum metal compound.” *See*, e.g., c. 2, ll. 33-35; c. 2, ll. 43-45; c. 2, ll. 55-57. Thus, in Cramer, the metallic mercury and mercury compound do not comprise at least one noble metal, as recited in claims 41 and 67. To the contrary, the at least one noble metal is added to the alumina slurry separately from the mercury compound and after the mercury compound has converted the aluminum to alumina.

With respect to the limitation that the monolithic hydrated alumina is grown on the surface of the aluminium or aluminium alloy, Cramer discloses that the aluminum itself is converted to alumina (i.e., the aluminum powder itself is changed from aluminum powder to alumina powder. Thus, there is no aluminum having a surface upon which to grow a monolithic hydrated alumina.) Further, while Cramer acknowledges that aluminum in sheet or ribbon form may be used if time of reaction is not important (because the sheet or ribbon is converted to alumina); Cramer also states “the physical form of the aluminum metal determines ... the rate of reaction between the aluminum and water... [thus] the higher the surface area of the aluminum exposed to the water, the faster is (sic) the rate of reaction ... it

is generally preferred that the aluminum used have a surface area in excess of 1000 square inches per pound.” C. 3, ll. 4-18. Because Cramer discloses complete conversion of aluminum to alumina, one of ordinary skill in the art would have no reason to modify the process of Cramer to grow a monolithic hydrated alumina on the surface of the aluminium or aluminium alloy, as recited in claims 41 and 67.

With respect to the limitation of exposing said covered surface to a wet oxidizing atmosphere, Cramer states “an excess of water in the liquid phase [is] ... present in the reaction mixture for forming the alumina slurry.” C. 4, ll. 65-67. Thus, Cramer does not disclose or suggest exposing a covered surface to a wet oxidizing atmosphere, as recited in Claim 41 and 67. Rather, Cramer discloses that aluminum powder is placed in an excess of water in order to form the alumina slurry. Removing the aluminum powder from the excess water forming the slurry would alter the principle of operation of Cramer.

Csordas discloses a process producing aluminum oxide powder for use in producing ceramic bodies by sintering. *See*, c. 1, ll. 15-17. According to Csordas, “the finer the alumina powder, the better the resulting sintered bodies.” C. 1, ll. 23-25. The process comprises amalgamating a surface of an aluminum body and then exposing the surface to oxygen and water vapor. *See*, c. 1, ll. 53-56. The amalgam is produced by contacting the aluminum body with an aqueous solution of a mercuric salt, e.g., mercuric chloride or mercuric cyanide. *See*, c. 1, ll. 60-63. After the aluminum body is contacted with the aqueous solution of a mercuric salt, the aluminum body is preferably rinsed with water and then dried to remove any rinsing water adhering to the surface before being placed in an airstream saturated with water vapor for blooming to occur. *See*, c. 1, ll. 63-66. Thus, Csordas teaches that the aluminum body should be dry in order for blooming to occur. In contrast, Cramer teaches that the aluminum powder thereof must be placed in an excess of water to form a slurry. Accordingly, one of ordinary skill in the art would have no reason to combine the divergent teachings of Csordas and Cramer because to do so would alter the principle of operation of Cramer. If the proposed modification or combination of the cited references would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *See*, MPEP 2143.01 VI (citing *In re Ratti*, 270 F.2d 810 (CCPA 1959)).

Further, even if the references were combined, the combination would not render the claimed process obvious because the combination does not teach or reasonably suggest all of the limitations of claims 41 and 67. The combination does not disclose or teach a mercury

amalgam comprising at least one noble metal. As discussed above, Cramer does not disclose a mercury amalgam comprising a noble metal, and Csordas does not disclose anything about noble metals. Further, the combination does not disclose or teach that a monolithic hydrated alumina is grown on the surface of the aluminum or aluminum alloy. As discussed above, Cramer discloses conversion of aluminum powder to alumina rather than growing a monolithic hydrated alumina on the surface of aluminum. Csordas discloses formation of alumina powder having a very fine structure (*see*, c. 2, ll. 7-9) rather than formation of a monolithic alumina. Based on the foregoing, Applicants submit that claims 41 and 67 are not obvious in view of the combination of Cramer and Csordas. Accordingly, Applicants respectfully request reconsideration and withdrawal of the instant rejection.

Cramer, Csordas and Murrell

Claims 47, 48, 56, 57, 62, 65-82, 85-89 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Cramer in view of Csordas further in view of U.S. Patent No. 4,778,779 to Murrell ("Murrell"). Applicants respectfully traverse. For the sake of argument, Applicants submit that even if Murrell teaches everything that the Office Action states it teaches, such teaching is not sufficient to overcome the deficiency of Cramer and Csordas, i.e., Murrell fails to provide any teaching that would provide a reason for combining Cramer and Csordas given the complete divergence in the teachings of these references. Further, Murrell does not overcome the above-described deficiencies of the combination of Cramer and Csordas because Murrell does not disclose covering an aluminum or aluminum alloy surface with a mercury amalgam comprising at least one noble metal. Thus, even if Cramer and Csordas were combined with Murrell, the combination would not teach or reasonably suggest all of the limitations of claims 41 and 67. As such, Applicants respectfully request reconsideration and withdrawal of the instant rejection.

Cramer, Csordas, Murrell and Davis

Claims 58, 63 and 64 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Cramer in view of Csordas, further in view of Murrell, further in view of U.S. 5,187,138 to Davis ("Davis"). Applicants respectfully traverse. For the sake of argument, Applicants submit that even if Murrell and Davis teach everything that the Office Action states they teach, such teaching is not sufficient to overcome the deficiency of Cramer and Csordas, i.e., Murrell and Davis fail to provide any teaching that would provide a reason

for combining Cramer and Csordas given the complete divergence in the teachings of these references. Further, Davis does not overcome the above-described deficiencies of the combination of Cramer, Csordas, and Murrell because Davis does not disclose covering an aluminum or aluminum alloy surface with a mercury amalgam comprising at least one noble metal. Thus, even if Cramer and Csordas were combined with Murrell and Davis, the combination would not teach or reasonably suggest all of the limitations of claims 41 and 67. As such, Applicants respectfully request reconsideration and withdrawal of the instant rejection.

Cramer, Csordas, Murrell, Davis and Puskas

Claims 54, 55, 59-61, 83 and 84 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Cramer in view of Csordas further in view of Murrell further in view of U.S. Patent No. 4,151,267 to Puskas ("Puskas"). Applicants respectfully traverse. For the sake of argument, Applicants submit that even if Puskas, Murrell, and Davis teach everything that the Office Action states they teach, such teaching is not sufficient to overcome the deficiency of Cramer and Csordas, i.e., Puskas, Murrell, and Davis fail to provide any teaching that would provide a reason for combining Cramer and Csordas given the complete divergence in the teachings of these references. Further, Puskas does not overcome the above-described deficiencies of the combination of Cramer, Csordas, Murrell, and Davis because Puskas does not disclose covering an aluminum or aluminum alloy surface with a mercury amalgam comprising at least one noble metal. Thus, even if Cramer and Csordas were combined with Murrell, Davis, and Puskas, the combination would not teach or reasonably suggest all of the limitations of claims 41 and 67. As such, Applicants respectfully request reconsideration and withdrawal of the instant rejection.

For the foregoing reasons, claims 41-45 and 47-89 are considered to be allowable. A Notice to this effect is respectfully requested. If any questions remain, the Examiner is invited to contact the undersigned at the number given below.

The Director is hereby authorized to charge any appropriate fees that may be required by this paper, and to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

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